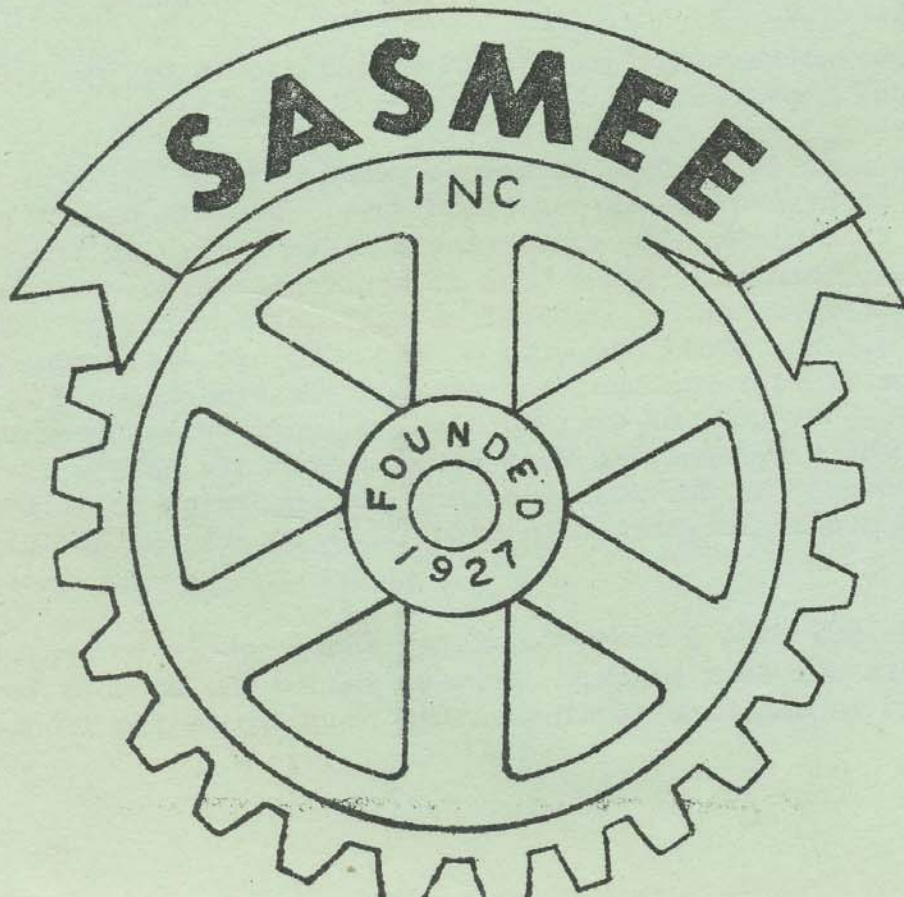


Sept - Nov 1969

S A S M E E
SOUTH AUSTRALIAN SOCIETY OF MODEL
& EXPERIMENTAL ENGINEERS
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BULLETIN

THE OFFICIAL JOURNAL OF THE SOUTH AUSTRALIAN SOCIETY
OF MODEL AND EXPERIMENTAL ENGINEERS.



EDITORIAL

The fast growing public awareness of S.A.S.M.E.E. is evidenced by the increasing number of appeals by various fund raising organisations to stage an exhibition of static and working models as an added attraction, to encourage the public to assist their worthy causes financially. Regrettably, we have to say 'no' quite often owing to other engagements and our own club commitments. However, whenever possible, we accede to a request for assistance and take pleasure in doing so. That our help is appreciated is proven by letters of appreciation received and requests for a future date.

On another page are listed coming events of the nature as outlined above.

A move is on foot to have a member of the St. John Ambulance in attendance at our Field days. We have been fortunately free of persons sustaining serious injury on track days, but your Committee feels that it would be a wise move to have an Officer present in case of an accident occurring. There is quite often a small boy with a cinder in his eye, and a grazed knee or similar mishaps, and trained assistance would be very useful. At time of writing nothing concrete has been decided upon, but I am awaiting full details from St. John's as to our best move. In the meantime they are supplying an Officer (incidentally interested in modelling) to attend the July meeting.

We now have a Track Committee whose job is to improve and maintain our loco track. Drivers should now be able to look forward to smoother running as the rough spots are ironed out.

EDITORIAL (Contd.)

Regarding the coming Easter Convention at S.A.S.M.E.E. 1970, a Committee has now been formed. It is composed of one General Committee man, namely John Welch, and two Club Members; Morrie Turner and Len Peckham, and headed by our President. All of these members are well conversant with Convention requirements, having each attended a number of Interstate affairs besides our own. Len should be particularly useful as his job takes him all over the City and no doubt he has many useful contacts.

Members whose Annual Subs. are overdue are reminded that our Treasurer is always pleased to take their money.

Members are urged to attend Field Days and help the Track Supervisors to steer small children from creating a hazard to the loco drivers. With our increasing public support, it is rapidly becoming a real problem to educate parents to control their offspring and keep them out of danger.

NEW MEMBERS:

A warm welcome is extended to Dean Di Giusto, interested in model ships, and Terry Fitton, also a boat man. These new members should prove a real shot in the arm to our Boat Section and we wish you many happy hours of modelling, and trust that you will join in all of our activities.

QUARTERLY AGENDA

GENERAL MEETINGS

1969

2nd Tuesday each month at 8.00 p.m.

9th SEPTEMBER

Jumble Sale.
Please bring along your unwanted bits and pieces and help to swell the Club Funds.

14th OCTOBER

Talk on Injectors by Dave Worrell

11th NOVEMBER

Film Night.

INTERMEDIATE
MEETINGS

(Informal) 4th Tuesday each month at 8.00 p.m. 23rd September, 28th October, and 25th November.

COMMITTEE
MEETINGS

1st Tuesday each month at 8.00 p.m.
2nd September, 7th October, 4th November.

WORKING BEES

1st Saturday each month at 2.00 p.m.
6th September, 4th October, 1st November.

PUBLIC FIELD DAYS

3rd Saturday each month at 2.00 p.m.
20th September, 18th October, 15th November.

FIELD DAY CANTEN ROSTER

SEPTEMBER

H. BATEUP
J. DAVEY

OCTOBER

D. WHITE
J. McPHARLIN

NOVEMBER

SERAFINO FACCENDA
D. ALLAN

IMPORTANT NOTE

IF UNABLE TO ATTEND AS PER ROSTER
PLEASE PHONE SECRETARY: Ph.79-5292
SO THAT A RESERVE CAN BE NOTIFIED
IN TIME.

'Please remember to bring the milk'.

ROSTER FOR LOCKING UP ALL BUILDINGS AND GATES

SEPTEMBER	6th	J. WAKEFIELD	NOVEMBER	8th	D. IRVING
	13th	C. HILL		15th	J. WAKEFIELD
	20th	A. BRABHAM		22nd	C. HILL
	27th	N. KERNICK		29th	A. BRABHAM
OCTOBER	4th	I. CLARK	DECEMBER	6th	N. KERNICK
	11th	B. BROWN		13th	I. CLARK
	18th	T. ENGLAND		20th	B. BROWN
	25th	P. GRISCTI		27th	T. ENGLAND
NOVEMBER	1st	J. WELCH	JANUARY	3rd	P. GRISCTI
					1970

S.A.S.M.E.E. CLUB NEWS:

A letter from our wandering club member Bob Smith, mentions that he expects to be returning home soon, and sends his regards to all S.A.S.M.E.E. Members.

At the June Field Day we had a near record attendance of the Public, among them being several Associations each sponsoring a number of children, which had led us to requesting the bodies concerned to be rostered to relieve the pressure on the loco track.

Work on the filling with quarry rubble at the Steam Bay and lane is proceeding very well and should make life a bit less hazardous for drivers when raising steam.

Good progress is being made with our Electrical Installations.

The Lions Club, sponsoring 80 boys, brought along 30 on the June Field Day, another 30 on July meeting, and the remaining 20 will be given train rides at Allinga Avenue on 26th July.

An advertiser in the previous Bulletin stated that he had For Sale, 'Restless Steel Balls'. Ron Thompson of the Alice wrote stating that he sympathised with our friend, in view of the fact that he had a similar complaint.

S.A.S.M.E.E. CLUB NEWS (Contd.)

You probably get tired each quarter of seeing the following: Would members assist with articles for the Bulletin: but they would be appreciated.

The recently formed Track Maintenance Committee is composed of: Bob Brown, Howard Bateup, Len Peckham, Paul Griscti and Doug Iliffe. With such a good looking bunch of men, we can look forward to some very smooth running in the near future.

Are Traction Engines gaining in popularity? We now have 2 under construction, one by Bill Muller and the other by Paul Griscti, there could be others that I have not heard of.

The Steam House and Boat Pond never fail to attract their fair share of attention, and the efforts of those members who run this important side of S.A.S.M.E.E. deserve a word of appreciation.

Members assistance on Field Days to help in supervising the track at various points is requested. If uncertain what is required have a word with Bob Brown.

A successful track day to assist the Apex Club of Blackwood was held on Saturday 31st May. Owing to rain during the morning the affair was nearly cancelled, but by noon the weather cleared and we decided to go on with the show. Although the afternoon was fine the cold wind prevented a large crowd from attending, but those present enjoyed themselves.

S.A.S.M.E.E. CLUB NEWS contd.

At time of writing I have no further news of the suggested track at the Weapons Research at Salisbury, but several members have intimated that they would be pleased to run their engines on it, if and when it is laid.

We send our regards to Murray Mitchell and family who are enjoying a caravan holiday touring Queensland for a number of weeks.

Another absent member is John Barkes who left for England about a month ago, but he will be returning later in the year.

What is the fascination that 'Britannia' holds for model builders? At present we have running four 3½" and two 5" gauge models. One of our latest members, Jeff McPharlin, is commencing the construction of, I believe, a 3½", and rumour has it that "Uncle" is going ahead with his 3½". It is also quite possible that there are others inoculated with the same needle.

The July General Meeting was high-lighted by an excellent film show, and we thank those responsible for putting it on.

COMING EVENTS:

The proposed visit to Birdwood Museum will probably take place during September. At a later date, a day suitable for members will be decided on, and you can look forward to an enjoyable outing.

A number of members have intimated their intention of making the trip to Eddington at the Labor Day weekend. To a lover of steam this event is one of the years outstanding affairs and well worth the long run there and back.

November 29th we are giving the Northern Districts Y.M.C.A. branch a Field Day in order to help them raise funds for their worthy cause.

The Blackwood Festival of Christmas Tree has asked S.A.S.M.E.E. to assist with a static and working display of models in the Blackwood Hall during December 4th to 7th. We have agreed to assist and members are urged to co-operate. Paul Griscti is associated with the Festival and will answer any questions regarding same.

The Myer Emporium has invited us to participate in an exhibition of ships to be held during January 1970 on their 8th floor Gallery. As a Club we are not interested, but to any member who has a boat he would like to place on exhibition you could contact Mr. L.F. Connard, Publicity Officer, c/o, Myer Emporium, Rundle Street, Adelaide. Perhaps some of our younger members could be interested and encouraged by taking advantage of this proposal.

A number of visitors from the Whyalla Society were entertained at S.A.S.M.E.E. on 28th June. The afternoon was spent with the Northerners getting a real taste of smoke and steam and hot oil. With running over, a barbecue tea was laid on for the visitors and then we adjourned to the Club House to a film and slide show, for which thanks are due to Len and Max.

Sunday morning some of the visitors came along to 123, Allinga Avenue, and we had several hours driving 'Britannia' around my back garden. A quick lunch, then some more steaming, then we said "Good-bye, come again", and they set off for home, 240 miles away.

I have received recently some excellent photos from Ron Thompson of the Alice showing his 4-8-4 on his 7½" gauge ground level track. He mentions that the engine is performing well and is capable of hauling a real man-size load.

Some time ago, Ray Minchin of Claremont, W.A. also sent over a batch of snap-shots depicting his garden track in 5", 3½", 2½", and 1½" gauges. He states that the track is very similar in construction to that of S.A.S.M.E.E. with a total of 229 ft.

Jack Cousins of Maryborough, Victoria has sent along a beautiful collection of snaps taken at Eddington during the trip by S.A.S.M.E.E. boys during June 1968. He sends his regards to all and hopes for our continued success. These snaps will probably be handed to those whose loco figures on the various photos.

I have received Bulletins from a number of kindred Societies, and these will appear on the notice board for your perusal.

The "Big Wheel" reports that track work at Moorabbin has been speeded up and that satisfactory progress is being made.

The VMSLS News letter has a report on the Easter Convention at Ryde, and mentions the visit to Adelaide of Mr. and Mrs. Dudley Smith.

Sydney Society of Model Engineers Limited, report that negotiations with the Sutherland Shire Council have been successful to develop a complex in their Shire.

You can thank Bill Muller for the following wisdom or nonsense, depending upon your viewpoint.

It has long been the consideration of the author that the contributions of Edsel Murphy, specifically his general and special laws delineating the behaviour of inanimate objects, have not been fully appreciated. It is deemed that this is, in large part, due to inherent simplicity of the law itself.

As is well known to those versed in the state-of-the-art, Murphy's Law states that "If anything can go wrong, it will".

To show the all-pervasive nature of Murphy's work, the author offers a small sample of the application of the law in electronics engineering.

Page 11.

The more innocuous a design change appears, the further its influence will extend.

The necessity of making a major design change increases as the fabrication of the system approaches completion.

Dimensions will always be expressed in the least usable term. Velocity, for example, will be expressed in furlongs per fortnight.

Original drawings will be mangled by the copying machine.

MATHEMATICS:

In any given miscalculation, the fault will never be placed if more than one person is involved.

Any error that can creep in, will. It will be in the direction that will do the most damage to the calculation.

All constants are variables.

In any given computation, the figure that is most obviously correct will be the source of error.

A decimal will always be misplaced.

PROTOTYPING AND PRODUCTION:

Any material cut to length will be too short.

Tolerances will accumulate unidirectionally towards maximum difficulty of assembly.

The availability of a material is inversely proportional to the need for that material.

A dropped tool will land where it can do the most damage.
(Also known as the law of selective gravitation).

The probability of a dimension being omitted from a plan or drawing is directly proportional to its importance.

Interchangeable parts won't.

The most delicate component will drop.

Graphic recorders will deposit more ink on humans than on paper.

A failure will not appear till a unit has passed Final Inspection.

After the last 16 mounting screws have been removed from an access cover, it will be discovered that the wrong access cover has been removed.

After an access cover has been secured by 16 hold-down screws, it will be discovered that the gasket has been omitted.

Hermetic seals will leak.

Any safety factor set as a result of practical experience will be exceeded.

The man who developed one of the most profound concepts of the twentieth century is practically unknown to most engineers. He is a victim of his own law. Destined for a secure place in the engineering hall of fame, something went wrong.

His real contribution lay not merely in the discovery of the law but more in the universality and in its impact. The law itself, though inherently simple, has formed a foundation on which future generations will build.

In fact, the law first came to him in all its simplicity when his bride-to-be informed him of the impending birth of an heir to the family fortune.

THE STORY OF A LOCOMOTIVE -- by Bert Kirby (of Melbourne)

PART I

A Fascinating Record of Railway Engine Progress over a Century.

For considerably more than a century the locomotive has been one of the most important factors in the civilisation of the world. It is certain that the development of industry as we know it today would have been impossible without the means of rapid transport provided by the railways and the steam engine.

The first steam engine to run on a railway was built by Richard Trevithick in the year 1803. Special tracks to accommodate loaded wagons, drawn by horses or other means, has been developed, however for two centuries before that time.

Trevithick advocated the use of high pressure steam as against the low pressure of the cumbersome pumping engines in operation at the beginning of the last century. It was while constructing some high-pressure steam engine for the Penydarran ironworks, near Merthyr Tydfil, the Trevithick was persuaded to build a steam locomotive to haul trucks on the works tramway, until then served by horses.

This original locomotive used steam at high-pressure and weighed 5 tons. It was first tried on 13th February 1804, hauling a load of 20 tons at 5 miles per hour. Full details of this locomotive are not available, but the single cylinder is stated to have been 8½" diameter with a stroke of 4"-6". A very important feature of the engine was the discharge of the exhaust steam into the chimney to draw up the fire, the principle being still applied at the present day.

A year later an engine was built at Newcastle to Trevithick's design for the Wylam wagon way. This locomotive had four flanged wheels, to which were connected by gear wheels a crankshaft and a flywheel driven by a single cylinder.

In 1808 Trevithick exhibited in London a locomotive weighing 8 tons, which ran at 12 miles an hour on a circular track. The public were allowed to ride behind the engine for a small fee.

Trevithick's engines, although quite successful mechanically, were however, ahead of their time because the available track was not strong enough to bear the weight of a steam locomotive. Trevithick, therefore, did nothing further for locomotive development, but his genius has been perpetuated in the retention today of the principles he adopted more than a hundred years ago.

An attempt to overcome the difficulty arising from insufficiently strong rails was made by John Blenkinsop in 1811, who used a cogged driving wheel, which engaged with teeth cast on one side of the rails.

A line of this description linked the Middleton Colliery to Leeds in 1812, and a year later the collieries of Kenton and Coxlodge were joined by rail to the Tyne.

The engines on this line were fitted with two double-acting cylinders driving two shafts, with cranks set at right angles. These crankshafts were both geared to a shaft carrying the large cog-wheel, which engaged with the rack or toothed rail. The engines in use at Leeds were at work until 1935.

The next step in locomotive development is ascribed to William Hedley, who in 1813 designed an engine for the Wylam Colliery, the wooden rails of which had been replaced by cast-iron plates to facilitate steam haulage. This locomotive was the famous "Puffing Billy", now in the Science Museum at South Kensington. The engine ran on four wheels coupled together by means of cog-wheels and was driven by a pair of vertical cylinders.

The boiler was fitted with the "return flue" introduced by Richard Trevithick. The fire hole was situated alongside the chimney, and the flue, running to the back of the boiler,

was doubled back U-fashion, to provide the greatest possible heating surface between the fire and the water.

A tender, carrying the water tank, was attached to the engine, which, however, proved too heavy for the cast-iron plate rails, and it was rebuilt in 1815 as an eight-wheeled locomotive. It was altered again to a four-wheeler in 1830, when the Sylam line was re-laid with stronger edge rails of cast iron. This rebuilding provides an interesting sidelight on the interdependence of locomotive development with that of the track on which it runs.

It was this relationship between the progress in locomotive building and the construction of railways that was so keenly appreciated by the great George Stephenson, who devoted his time not only to the improvement of the engine itself, but also the railway construction and development.

It is not generally realised how great a debt is owed by the railways to the old colliery companies, out of whose needs for cheap haulage grew the development of the steam locomotive. It was as engine-wright at Killingworth Colliery that George Stephenson in 1814 built the first engine to run on iron edge rails without the use of the rack and pinion as employed by Blenkinsop. The first Killingworth locomotive was, however, modelled on that of Blenkinsop, and had two vertical cylinders 8" in diameter by 24" stroke, driving two countershafts.

These countershafts were geared together and to the driving wheel axles, an arrangement which, although successful, was also noisy. To overcome this difficulty, Stephenson built at Killingworth in 1815, a second engine which after a certain amount of experiment was fitted with connecting rods driving the wheels directly, the running axles being fitted with sprockets coupled by a chain similar to that now used on bicycles.

A single flue supplied the heating surface for the boiler of this engine, and the exhaust steam from the cylinders was taken to the chimney.

These early engines were constructed without springs to the wheels, and, as a result, derailments, due to the uneven track, were frequent. Stephenson overcame this difficulty in a most ingenious way, without, however, using springs as we have today.

In 1816 he constructed an engine in which the axle bearings were free to move up and down in guides, and were attached to pistons contained in cylinders fixed to the underside of the boiler. The pistons in these cylinders were exposed to the pressure of the boiler steam, and by this means the wheels were maintained in contact with the rails despite inequalities of the track.

George Stephenson built several of these "steam sprung" engines between 1816 and 1822, so providing a successful type of locomotive for hauling heavy colliery loads at low speeds.

The next step forward was the provision of railway transport for passengers, their requirements tending to speeds above that to which they were accustomed when travelling by stage-coach on the roads.

The first public railway in the world, the Stockton and Darlington Railway, was authorised in 1821, and George Stephenson was appointed engineer in the following year. Here again, Stephenson displayed his genius for development by advising the Company to apply for a new Act of Parliament giving power to carry passengers in addition to goods, and to use steam locomotives. From that time onwards George Stephenson confined his attention to railway construction, leaving the improvement of the locomotive to his son Robert and his associates. The firm of Robert Stephenson and Co. was responsible for the building of the Stockton and Darlington Railway's first engine, "Locomotion", which ran at the opening of the line on September 27th 1825.

This famous engine is now preserved at Darlington Station on the London and North Eastern Railway. There are four

wheels, driven directly by two vertical cylinders through connecting rods. The wheels were not sprung, but inequalities of the track were allowed for by mounting one of the axles in a tube with a central pivot under the boiler, an arrangement somewhat similar to that employed for the front wheels of a modern steam traction engine. The weight of the engine in working order was about 8 tons, and it was capable of hauling a load of some 50 tons at 5 miles an hour on a level track. The boiler was of the single flue type, similar to that of the Killingworth locomotive.

During 1825, and for a few years subsequently, many new types of locomotive were tested on the Stockton and Darlington line, a particularly interesting was the engine built by Robert Wilson, of Newcastle, which had four cylinders all driving directly on to one axle. In 1827, Stephenson and Co. built an engine with a pair of horizontal cylinders placed inside the boiler, and from which the drive was taken to the wheels by means of rods and levers. The same year a further improvement in locomotive design was effected by Timothy Hackworth, engine superintendent of the Stockton and Darlington Railway, by his construction of the "Royal George". This engine was built from the remains of Wilson's locomotive. Vertical cylinders were raised and inverted, so providing a direct drive to the wheels by means of short connecting rods. The boiler was made with a Trevithick's pattern return flue, and this had a much larger heating surface than those used for earlier engines. The exhaust pipe orifice in the chimney was contracted to increase the draught. The engine had 6 wheels, with an arrangement of compensating levers in place of springs. It is said that iron springs were first used for locomotive work at Killingworth early in 1827, wrought iron tyres for engine wheels having been introduced about the same time.

The next improvement of note was the locomotive "Lancashire Witch", built to Robert Stephenson's design in 1828. This engine had four coupled wheels driven by 2 inclined cylinders. The drive from the cylinders was taken by crank-pins on the front wheels, and both axles were fitted with springs.

The boiler contained 2 flues, having a fire-grate in each, with, however, a single chimney.

The engine was put to work on the Bolton and Leigh Railway, using coke as fuel, the necessary additional draught was being supplied by bellows. The engine was also fitted with valve gear which enabled steam to be cut off at half stroke, so using the steam expansively and economising fuel. The weight of this locomotive was 7 tons, and it was capable of hauling a load of 50 tons up a gradient of 1 in 440 at a speed of 8 miles per hour. Several engines were subsequently built to this design.

Part 2 of Bert's story will be in the next issue of the Bulletin.

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